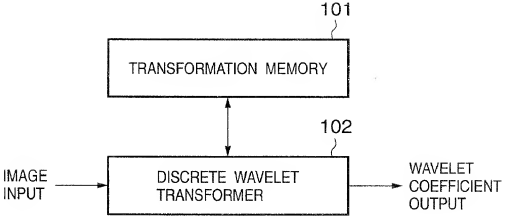
T02201-9162866D

FIG. 1



EP 2 081 201 A1 09.09.2009

FIG. 2A

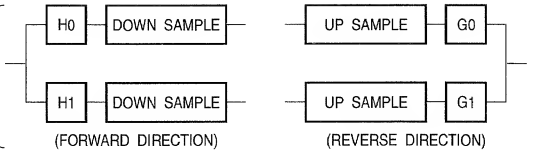


FIG. 2B

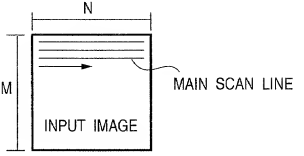


FIG. 2C

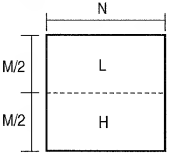


FIG. 2D

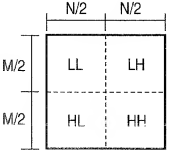


FIG. 3

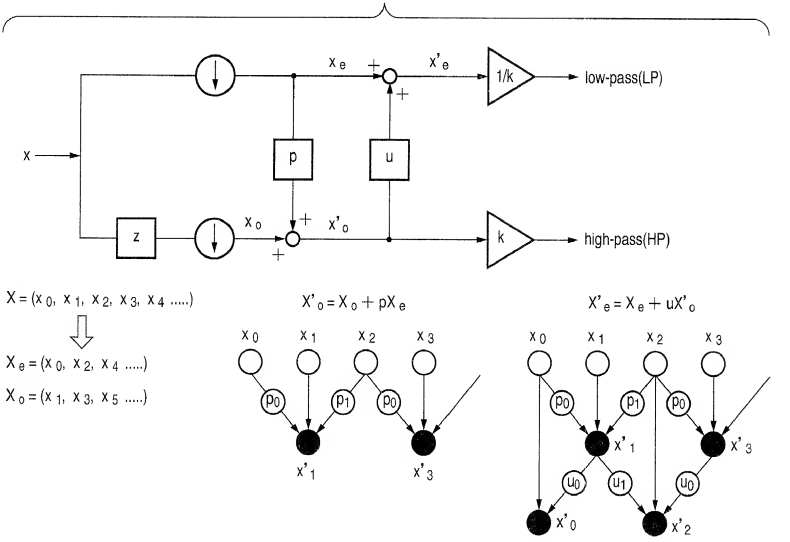

x
z
p
u
1/k
k
low-pass(LP)
high-pass(HP)
x_e
x'_e
x_o
x'_o
$X = (x_0, x_1, x_2, x_3, x_4 .....)$
$X_e = (x_0, x_2, x_4 .....)$
$X_o = (x_1, x_3, x_5 .....)$
$X'_o = X_o + pX_e$
$X'_e = X_e + uX'_o$
x_0 x_1 x_2 x_3
p_0 p_1 p_0
x'_1 x'_3
u_0 u_1 u_0
x'_0 x'_2

FIG. 4

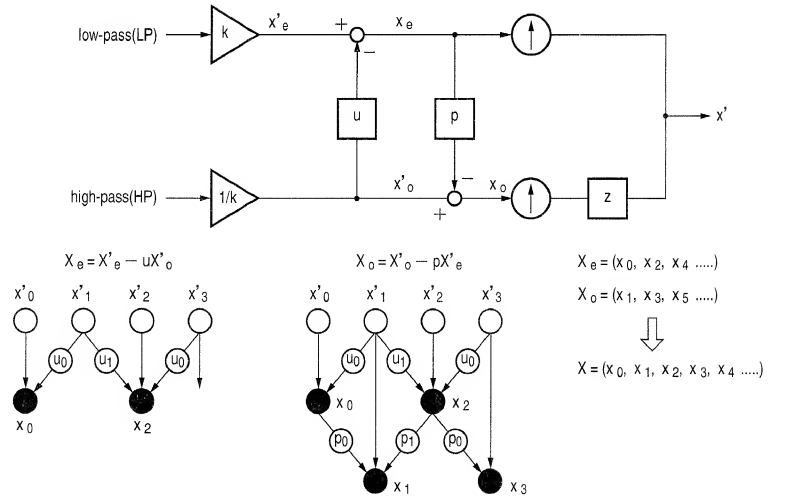

low-pass(LP)
k
x'e
+
xe
−
u
p
x'
high-pass(HP)
1/k
x'o
−
xo
+
z
Xe = X'e − uX'o
Xo = X'o − pX'e
Xe = (x0, x2, x4 .....)
Xo = (x1, x3, x5 .....)
X = (x0, x1, x2, x3, x4 .....)
x'0 x'1 x'2 x'3
u0 u1 u0
x0 x2
p0 p1 p0
x1 x3

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FIG. 5

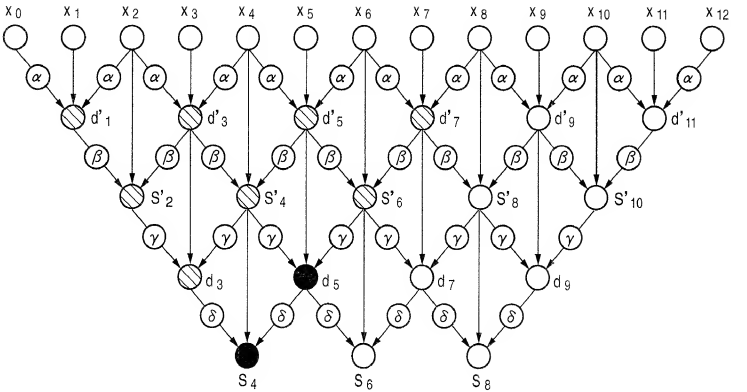
Filter	Filter coefficients	
	FORWARD DIRECTION	REVERSE DIRECTION
5×3 filter	H0 = [−1, 2, 6, 2, −1] /8 H1 = [−1, 2, −1] /2	G0 = [1, 2, 1] /2 G1 = [−1, −2, 6, −2,−1] /8

1020010091628660

FIG. 6

Filter	Lifting coefficients	
	FORWARD DIRECTION	REVERSE DIRECTION
5×3 filter	p = (−1, −1) /2 u = (1, 1) /4	p = (−1, −1) /2 u = (1, 1) /4

FIG. 7


x0
x1
x2
x3
x4
x5
x6
x7
x8
x9
x10
x11
x12
α
d'1
d'3
d'5
d'7
d'9
d'11
β
S'2
S'4
S'6
S'8
S'10
γ
d3
d5
d7
d9
δ
S4
S6
S8

EP 0 228 560 A2

FIG. 8

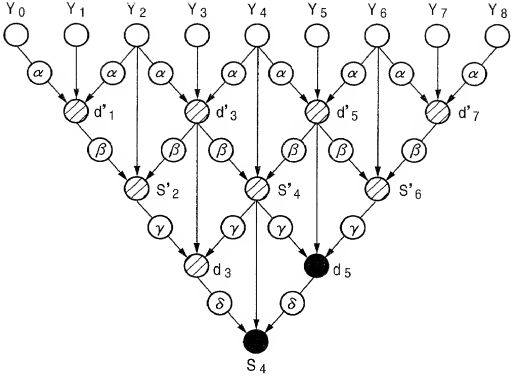
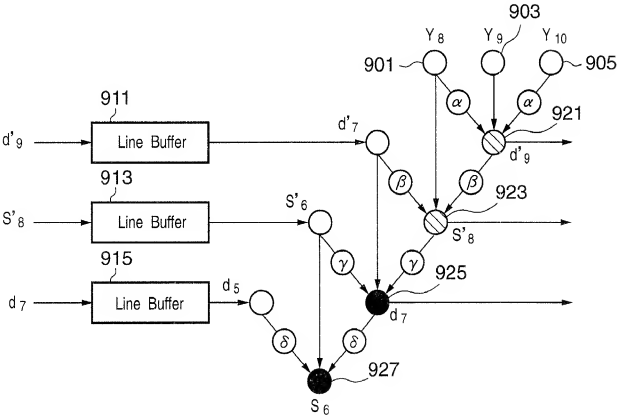


FIG. 9


903
Y 8
Y 9
Y 10
901
905
911
d'9
Line Buffer
d'7
α
α
921
d'9
913
S'8
Line Buffer
S'6
β
β
923
S'8
915
d7
Line Buffer
d5
γ
γ
925
d7
δ
δ
927
S6

T02201 9T628660

FIG. 10

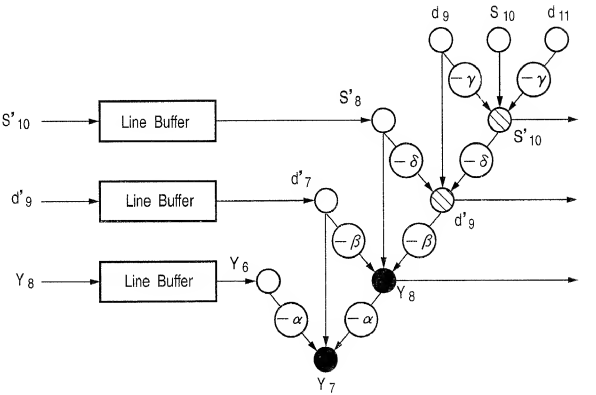
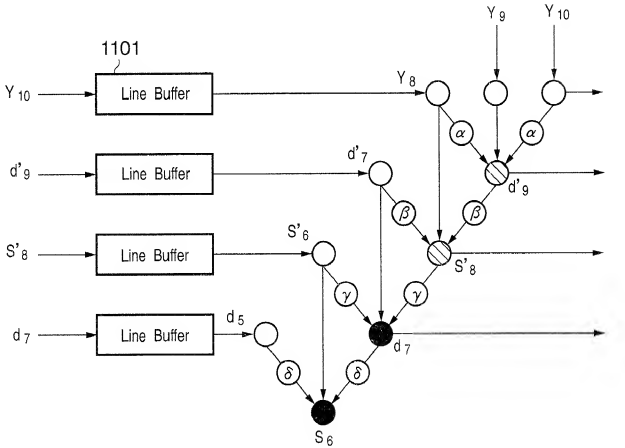


FIG. 11


1101
Line Buffer
Line Buffer
Line Buffer
Line Buffer
Y10
d'9
S'8
d7
Y8
d'7
S'6
d5
Y9
Y10
α
α
d'9
β
β
S'8
γ
γ
d7
δ
δ
S6

TD2201-916286660

FIG. 12

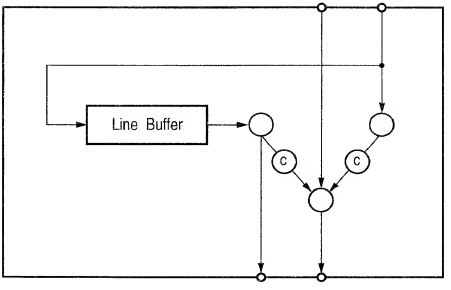


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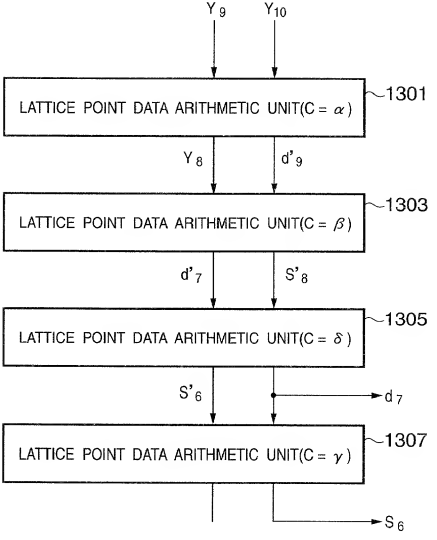
FIG. 13



JP2001-156286A 20010608

FIG. 14

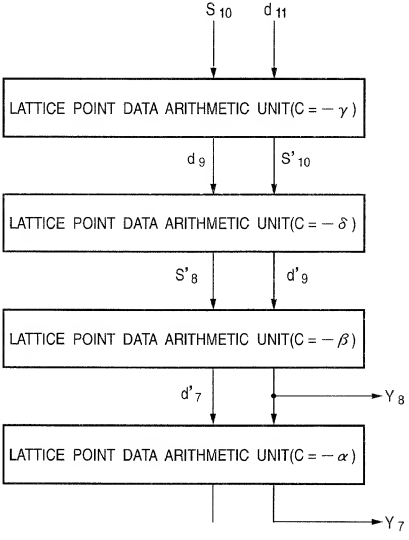


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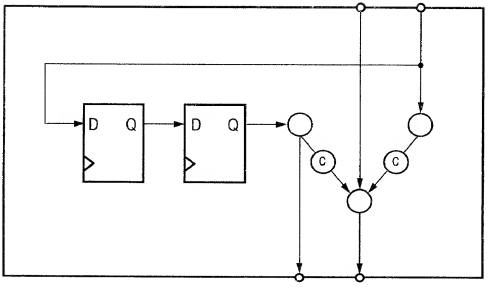
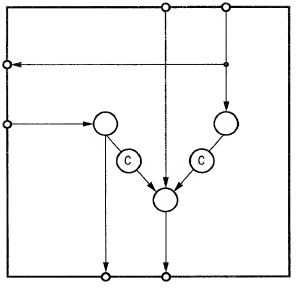
FIG. 15



EP2201916289A2.01220

FIG. 16



EP2201691A1 I 20100630

FIG. 17

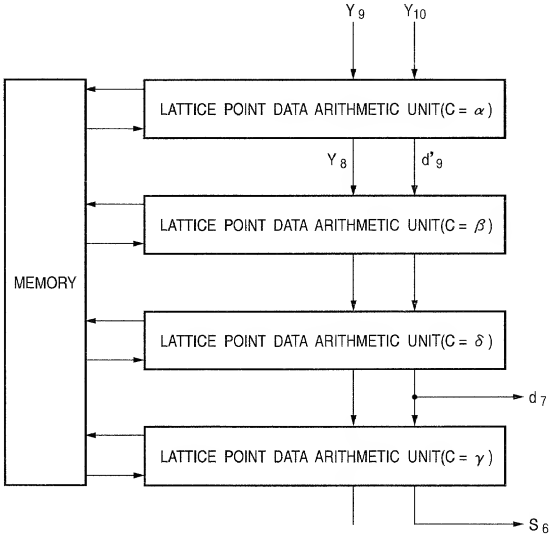
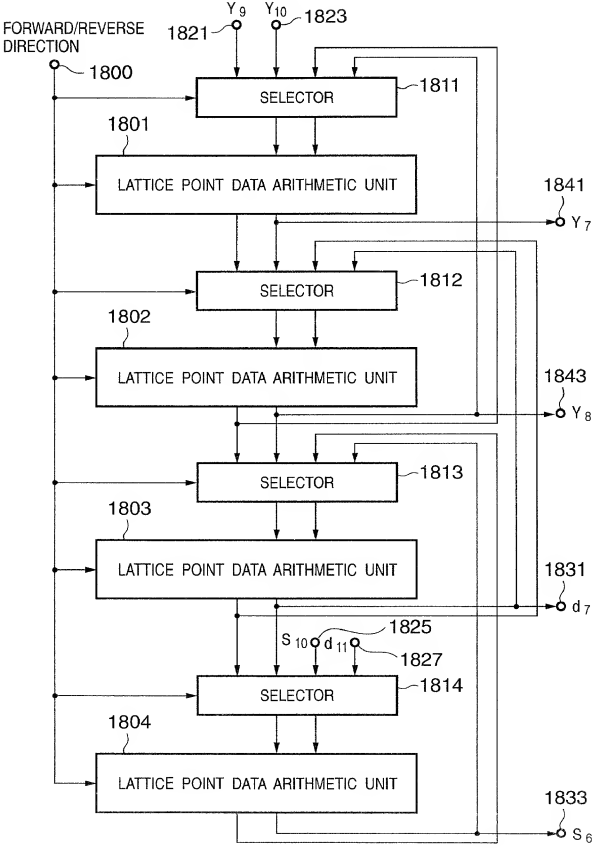


FIG. 18



09982916-102201

EP 0 916 238 B1 2001.10.17

FIG. 19

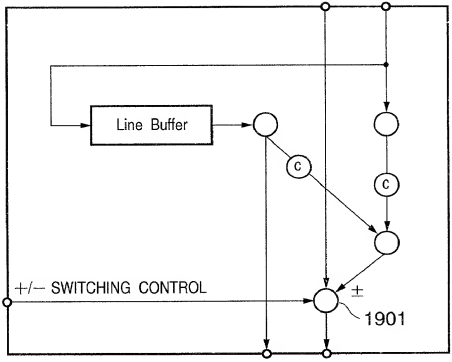


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FIG. 20A

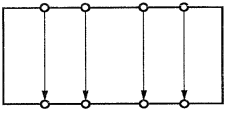


FIG. 20B

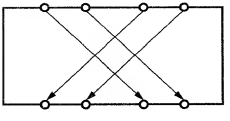
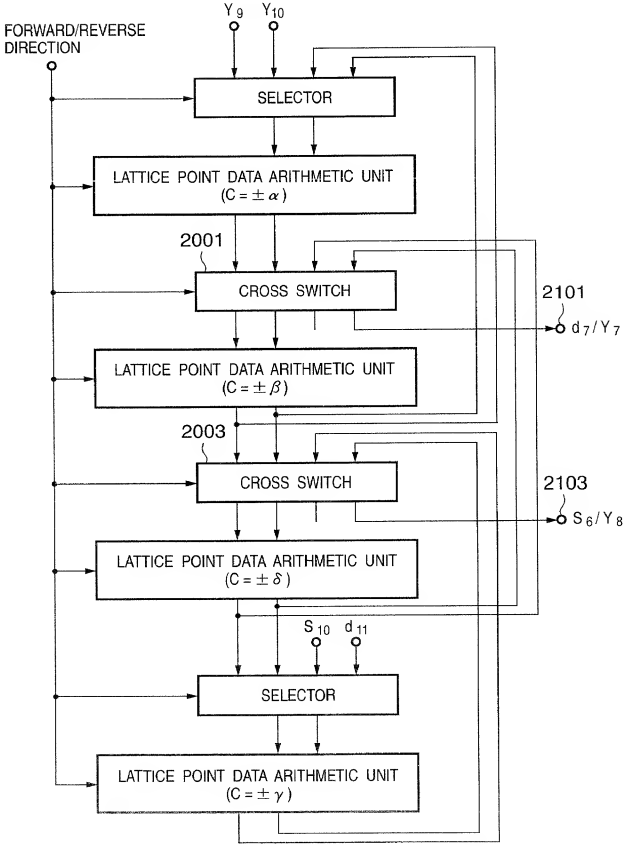


FIG. 21



JP2001-169280A 2001.6.22

JP2001-196201A 2001.7.19

FIG. 22

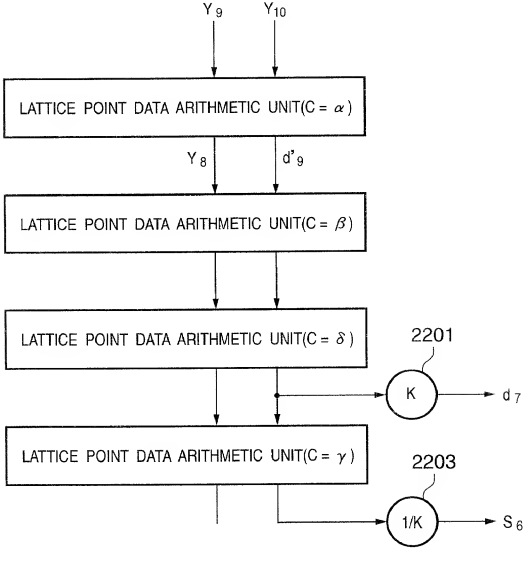
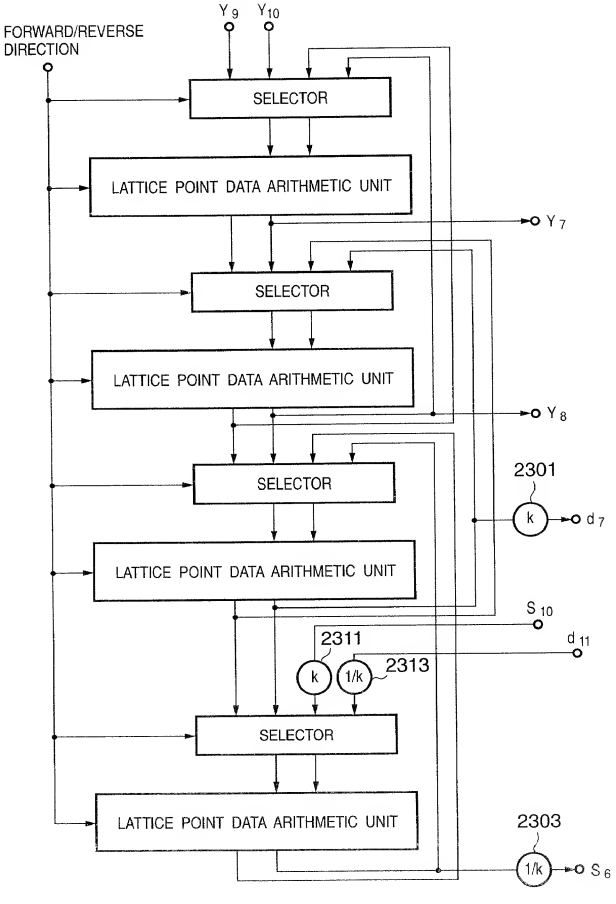
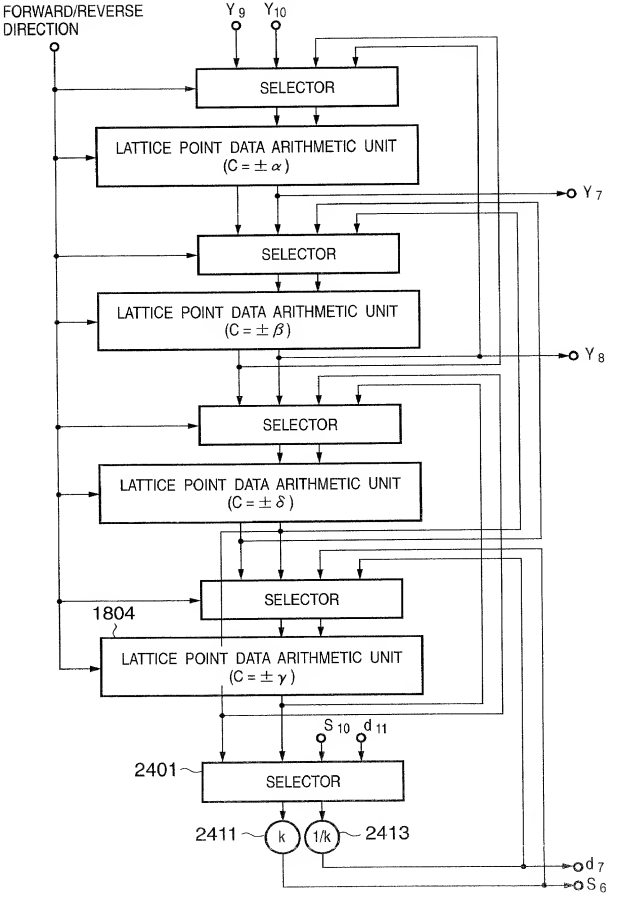


FIG. 23



09982916.102201

FIG. 24



0988216.102201

FIG. 25

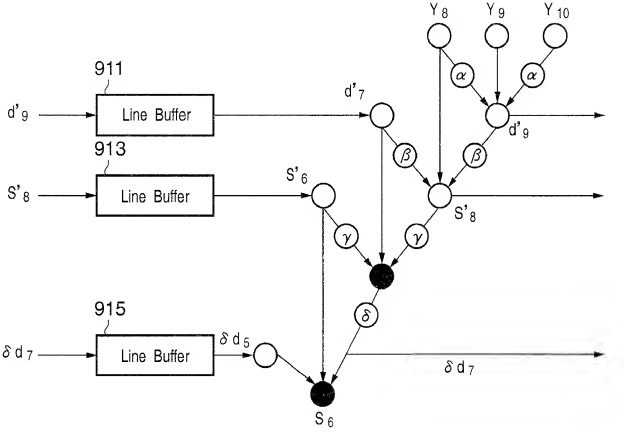
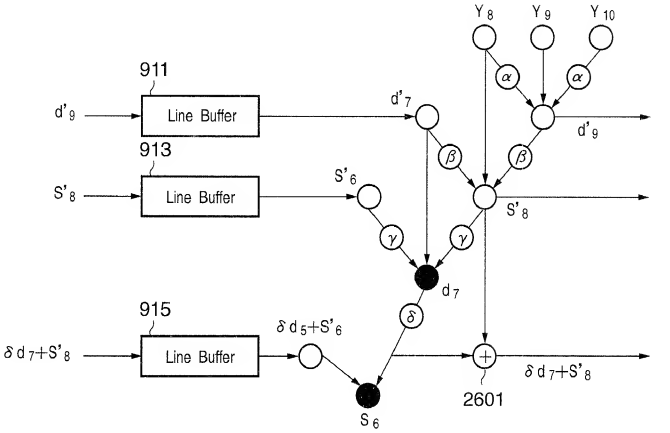
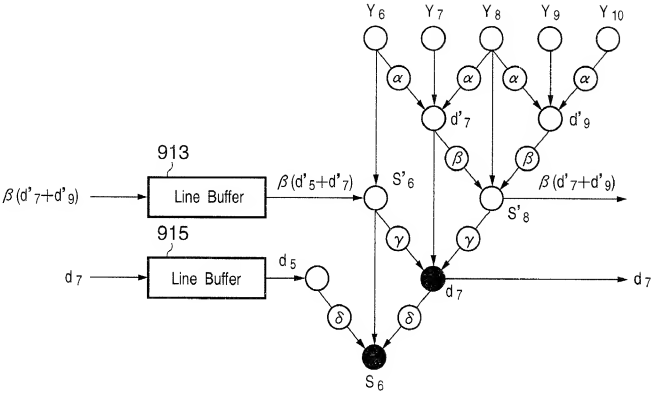

Y 8
Y 9
Y 10
911
Line Buffer
d'9
d'7
α
α
d'9
β
β
913
Line Buffer
S'8
S'6
S'8
γ
γ
δ
915
Line Buffer
δ d7
δ d5
δ d7
S6

FIG. 26


Y 8
Y 9
Y 10
911
d'9
Line Buffer
d'7
α
α
β
β
d'9
913
S'8
Line Buffer
S'6
S'8
γ
γ
d7
915
δ
δ d5+S'6
δ d7+S'8
Line Buffer
δ d7+S'8
2601
S6

EP 2 202 684 A1

FIG. 27



09882915 102201

FIG. 28

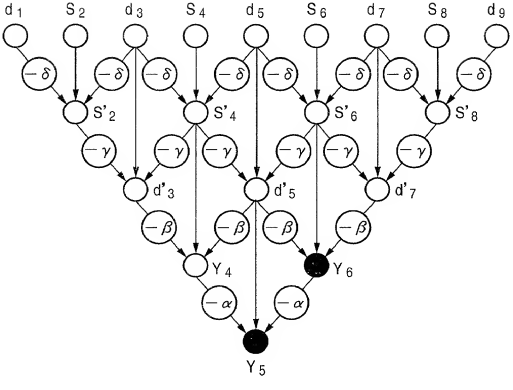
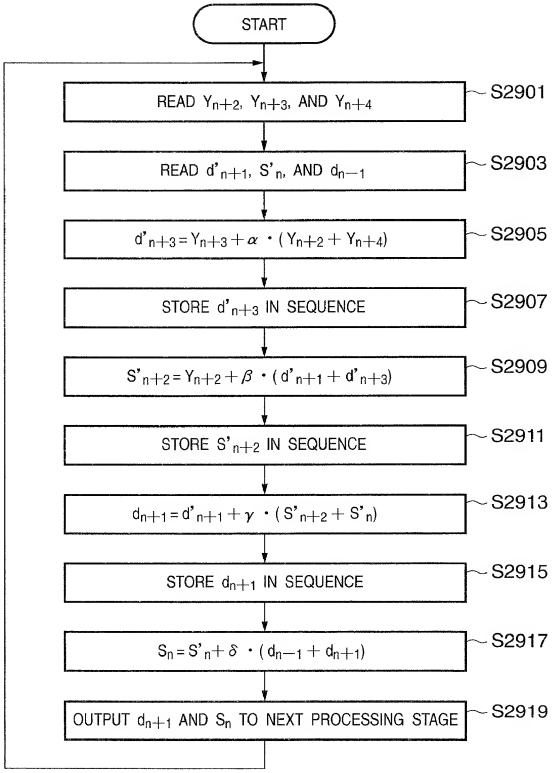


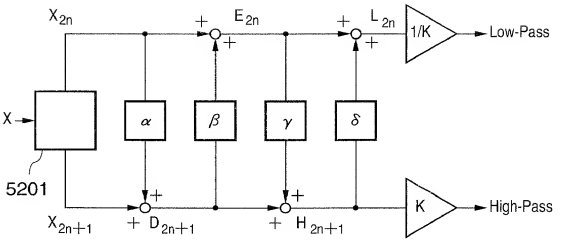
FIG. 29



KR 10-2007-0128660

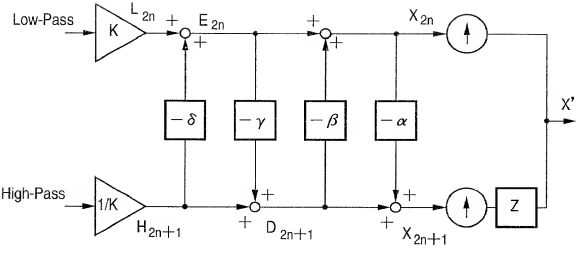
JP2001-016286D

FIG. 30



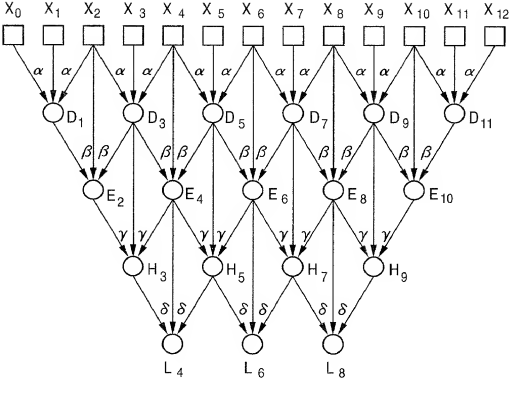
EP 2 091 015 A1 2009.08.19

FIG. 31



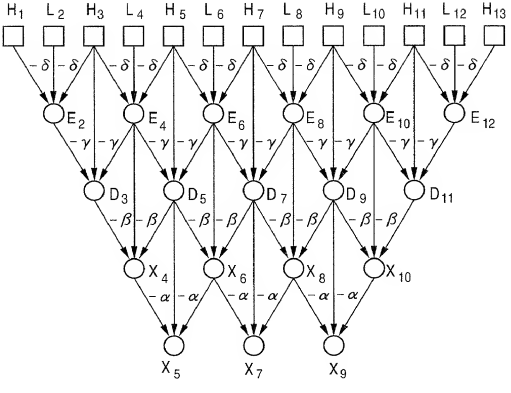
0988291B.102201

FIG. 32



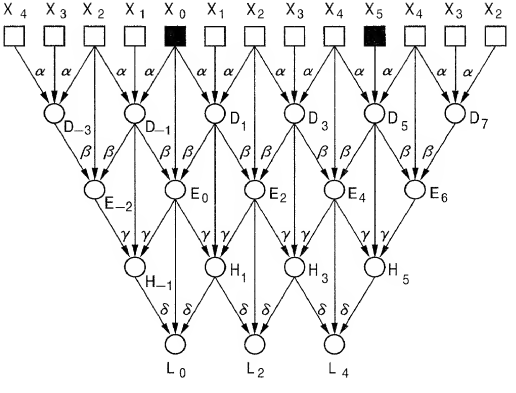
10220116.1 2016-09-22

FIG. 33



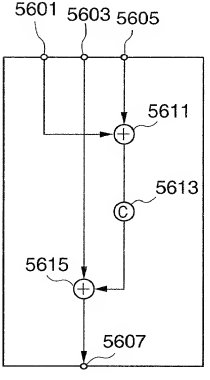
0098291S.102201

FIG. 34



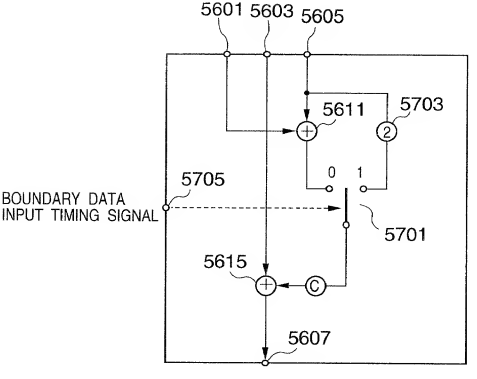
EP 2 201 991 628 660 A1

FIG. 35



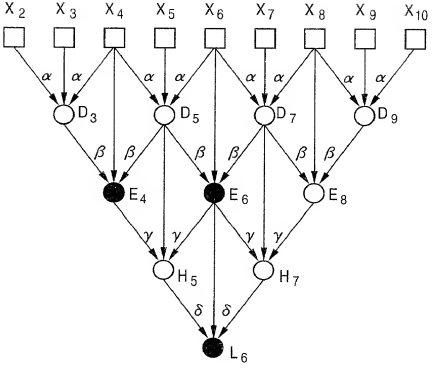
1022001-9162868690

FIG. 36



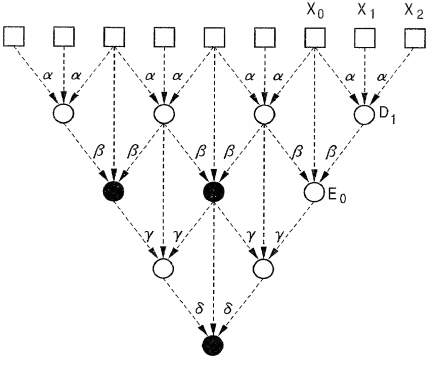
TO220T-9762860

FIG. 37



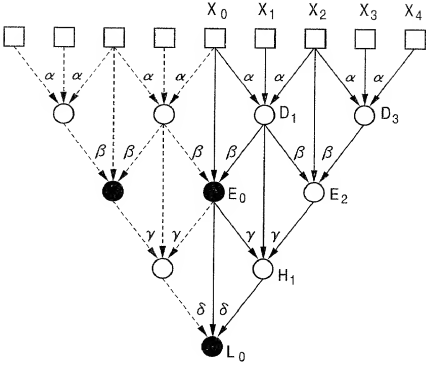
EP 0 916 286 A2

FIG. 38



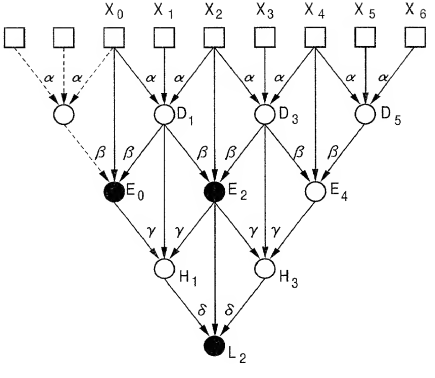
0098291G-102201

FIG. 39



JP2001-016288A 10.2201

FIG. 40



WO2021/168281 PCT/US2021/018660

FIG. 41

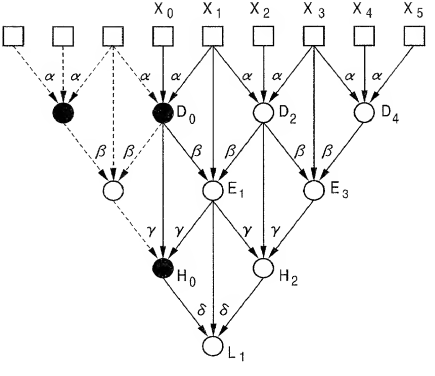


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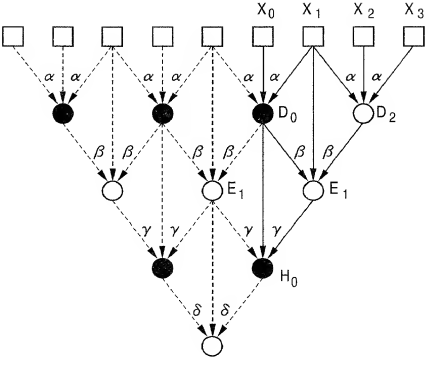
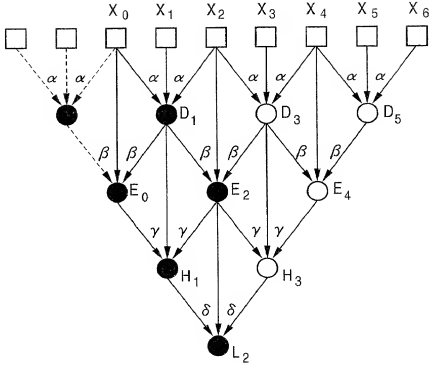
FIG. 42



TO2201T"9162366O

FIG. 43



TU2201-916288660

FIG. 44

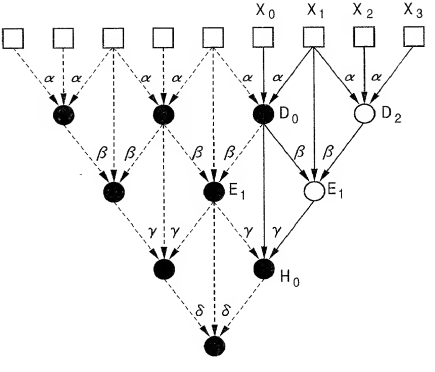
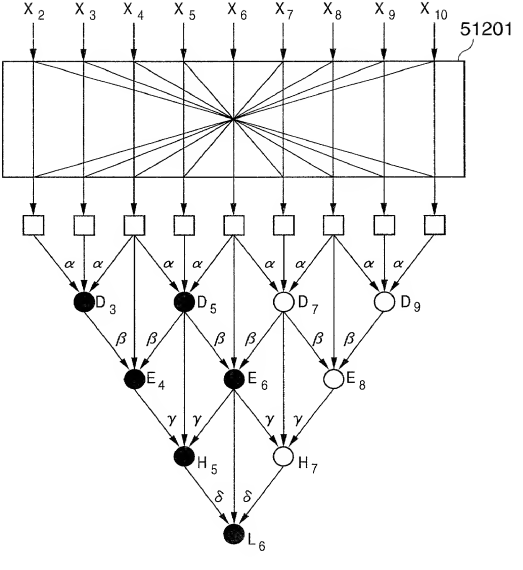
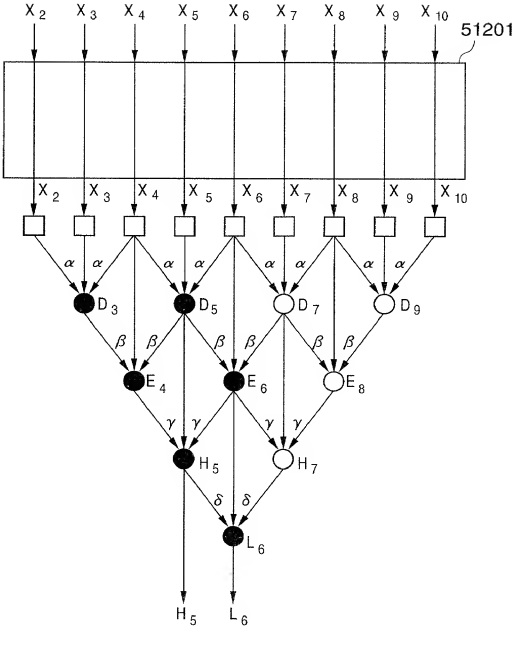


FIG. 45



JP2007-316660

FIG. 46



JP2021162869A 20211014

TD2201-9162860

FIG. 47

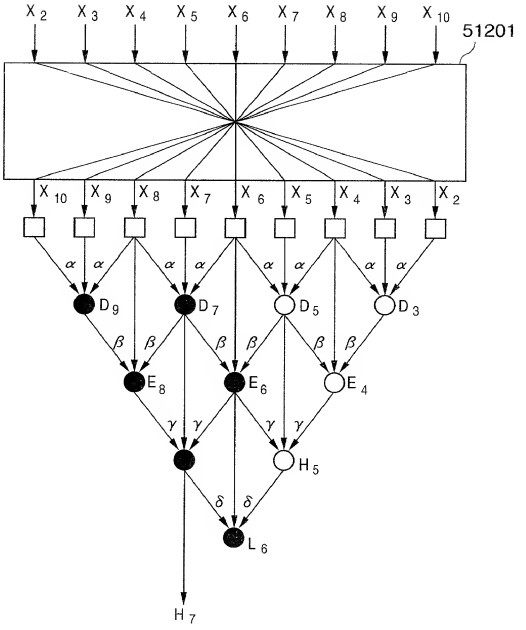


FIG. 48

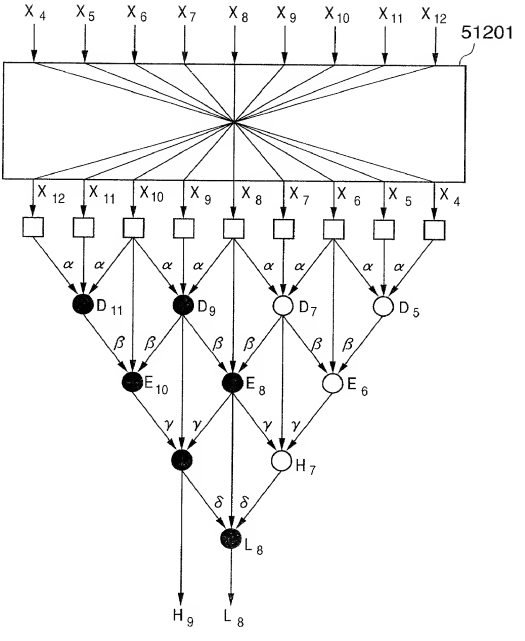


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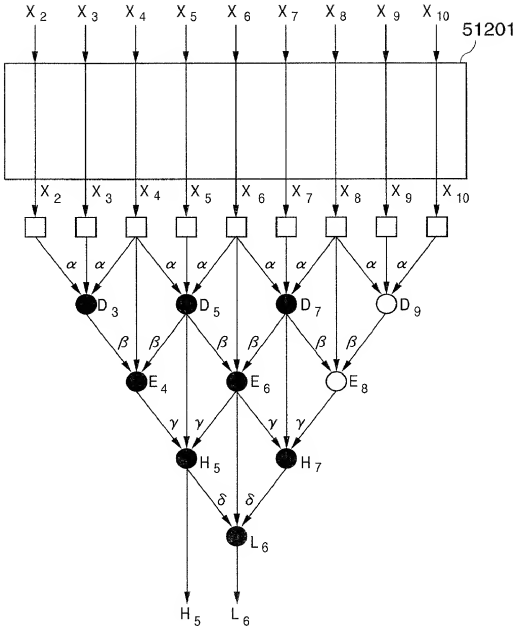
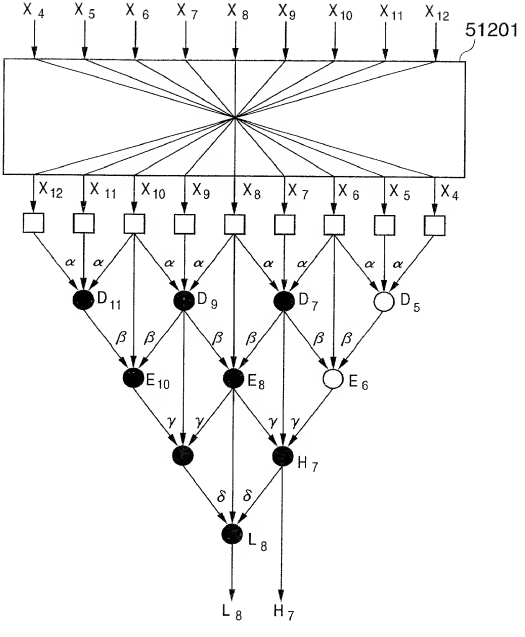
FIG. 49


X2 X3 X4 X5 X6 X7 X8 X9 X10
51201
X2 X3 X4 X5 X6 X7 X8 X9 X10
α α α α α α α α
D3 D5 D7 D9
β β β β β β
E4 E6 E8
γ γ γ γ
H5 H7
δ δ
L6
H5 L6

JP2007-166280A 2007.6.28

FIG. 50



JP2001-162860

FIG. 51

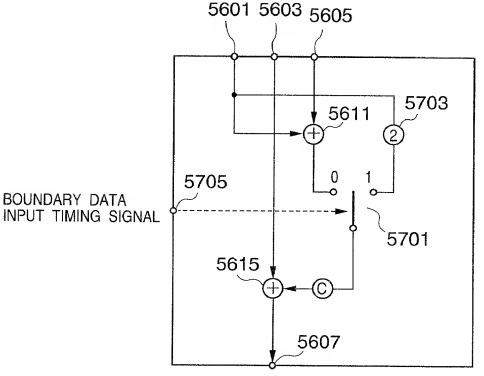


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FIG. 52

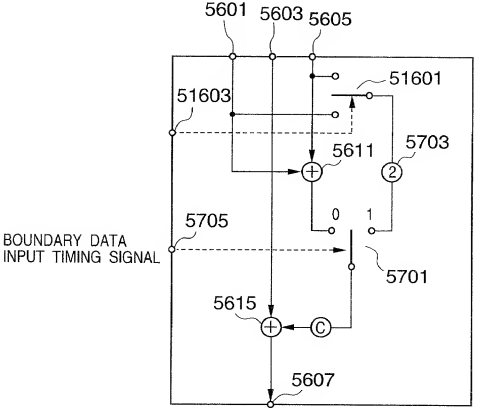

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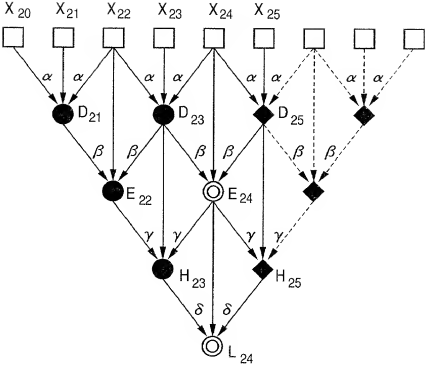
FIG. 53



JP2201-916288660

FIG. 54

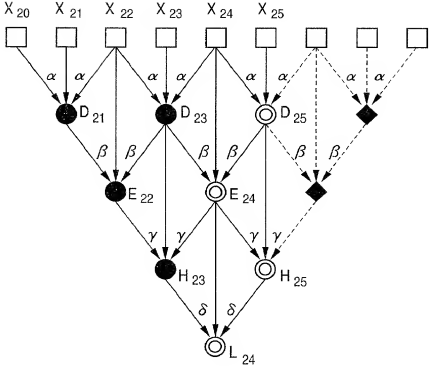


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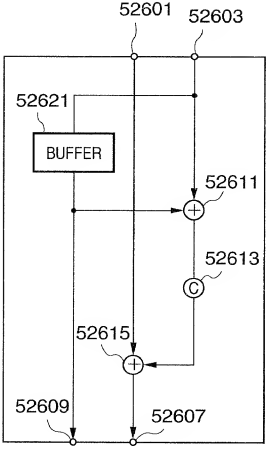
FIG. 55



JP2001-216360

FIG. 56

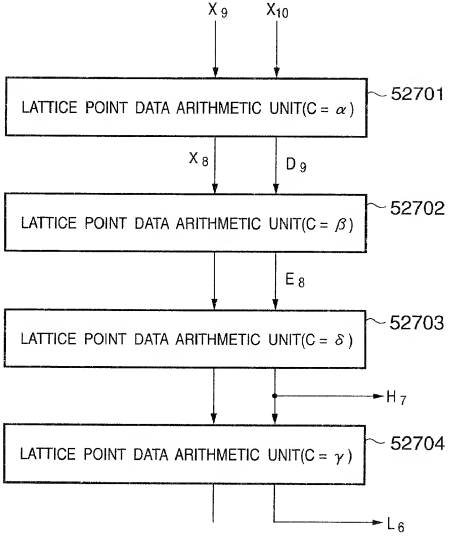


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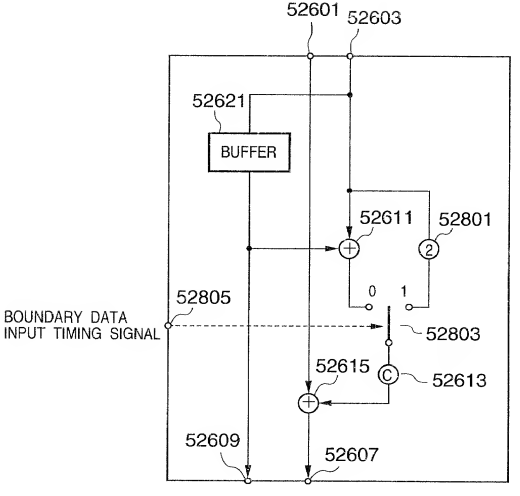
FIG. 57



JP2020-191660

FIG. 58

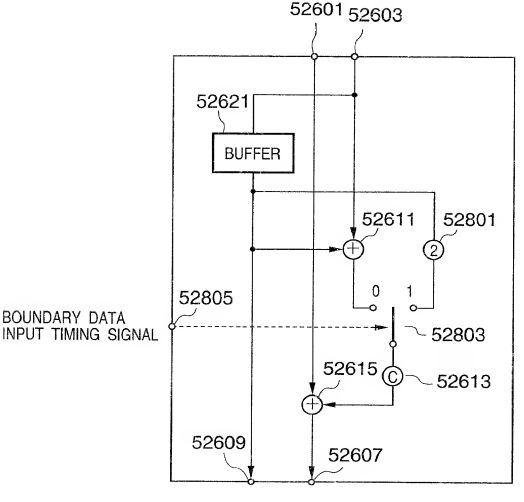


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FIG. 59

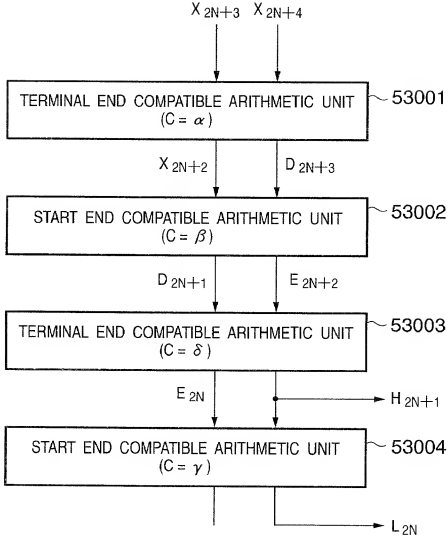

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FIG. 60

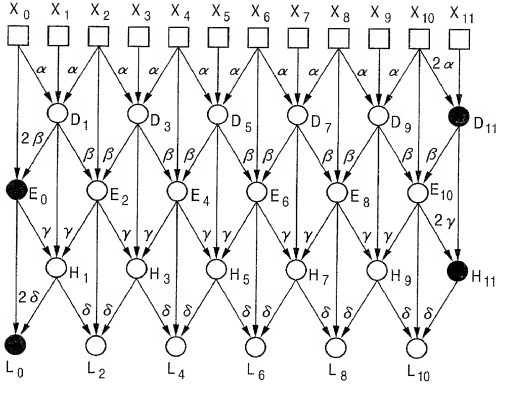

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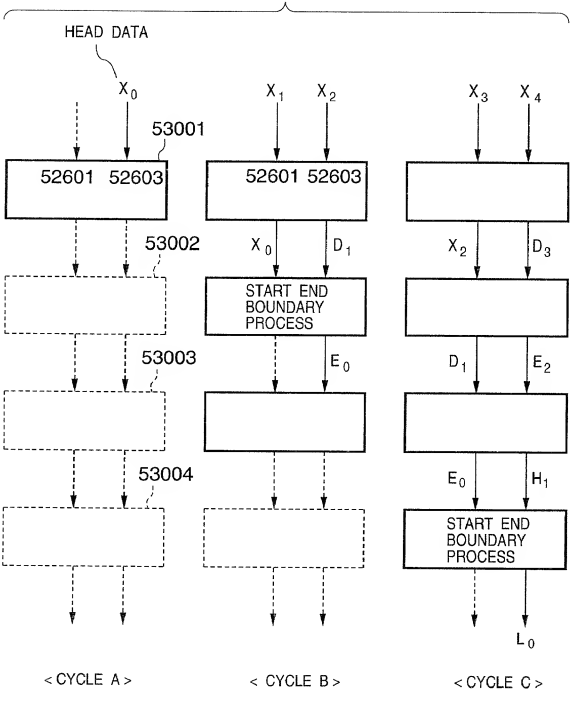
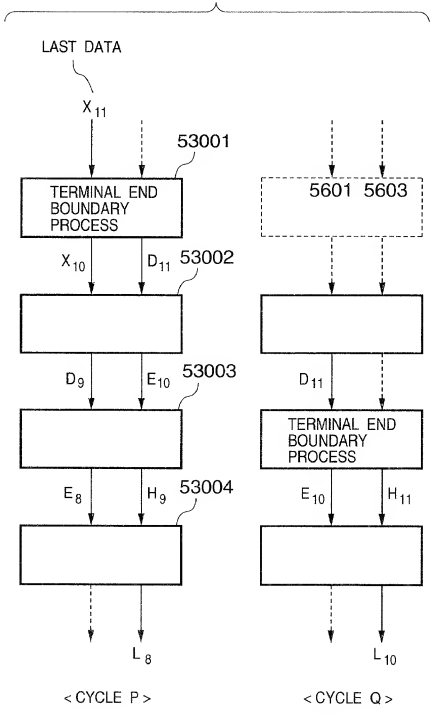
FIG. 61



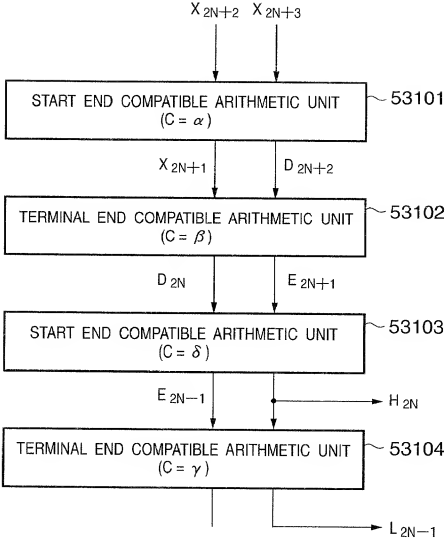
JP2021516286990

FIG. 62



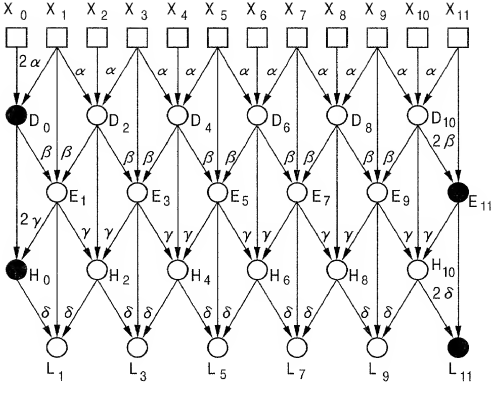
JP2021-128660 A 2021.09.02

FIG. 63



JP2021-196860

FIG. 64



JP2021516288660

FIG. 65

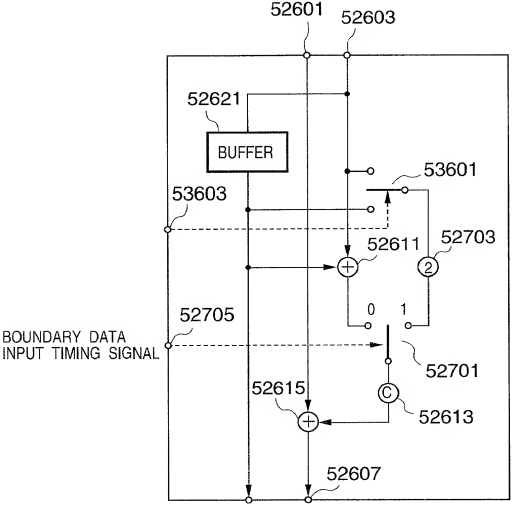


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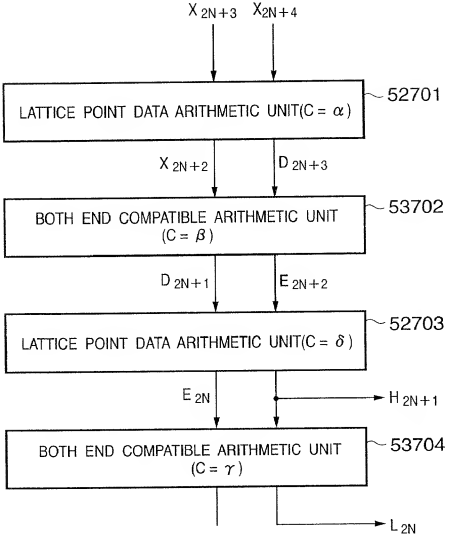
FIG. 66



JP2001-069228A 2001.03.16

FIG. 67

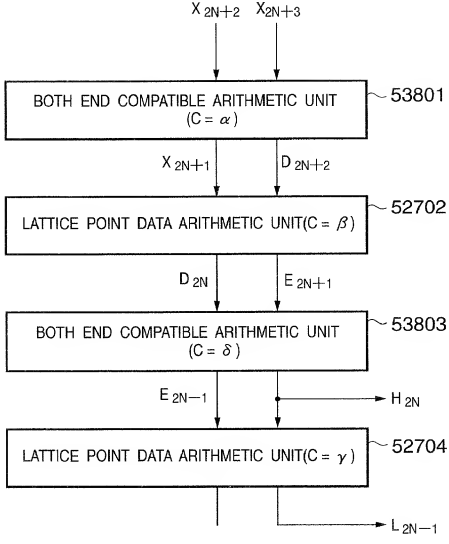


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FIG. 68

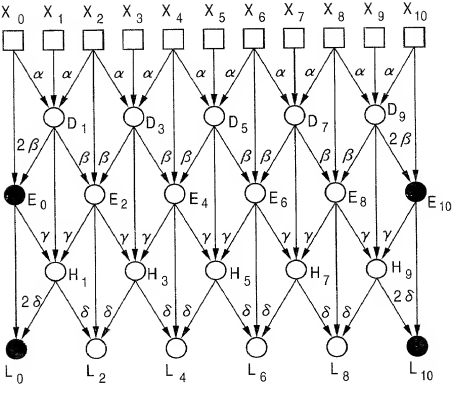

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FIG. 69

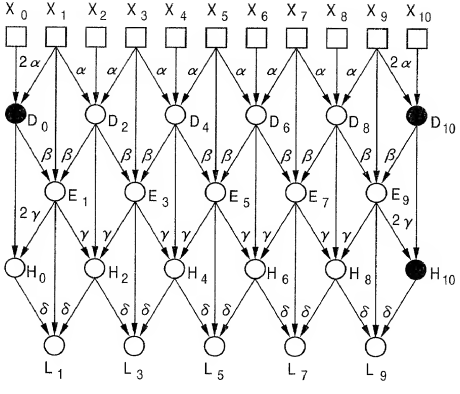

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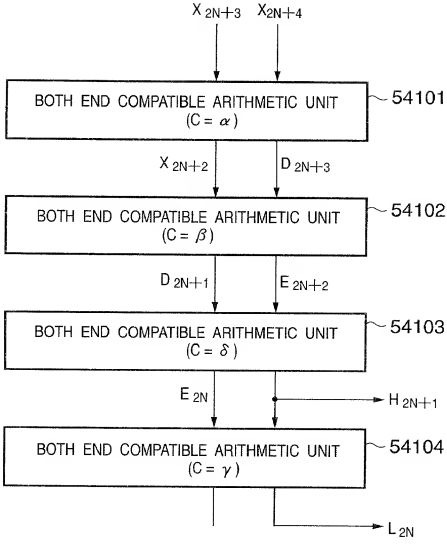
FIG. 70



JP2021-162916 A 2021.10.11

FIG. 71

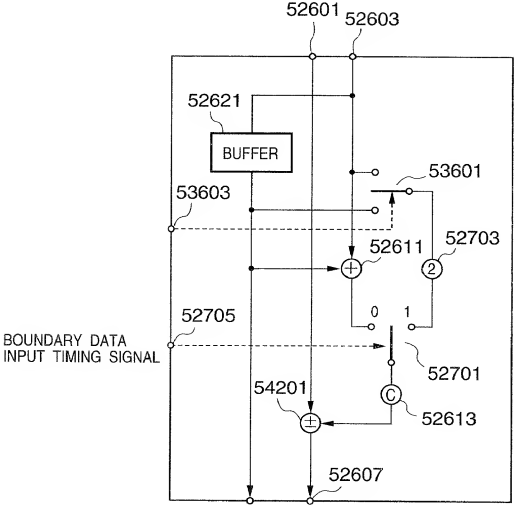
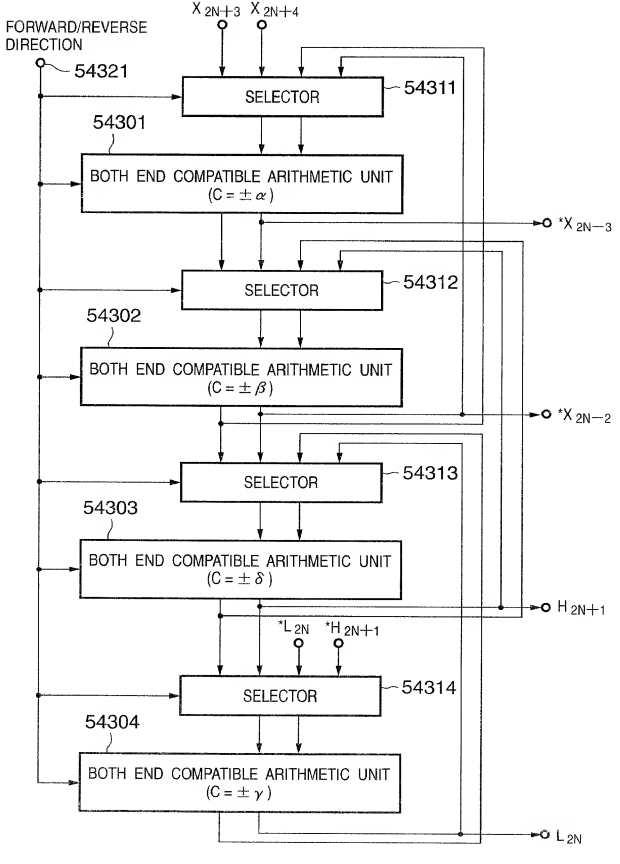


FIG. 72



JP2021-168690-A-2021-10-28

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FIG. 73

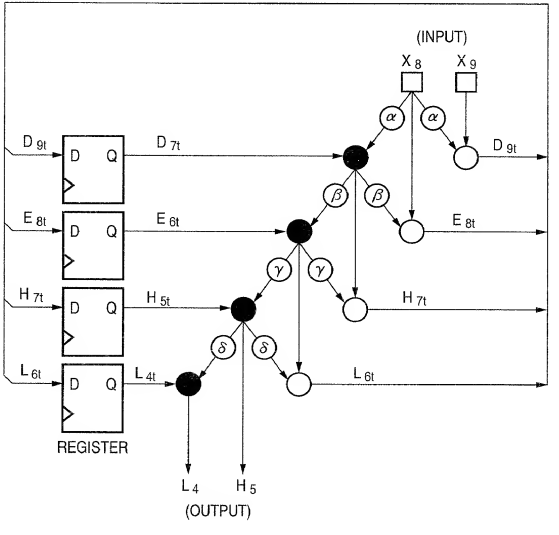
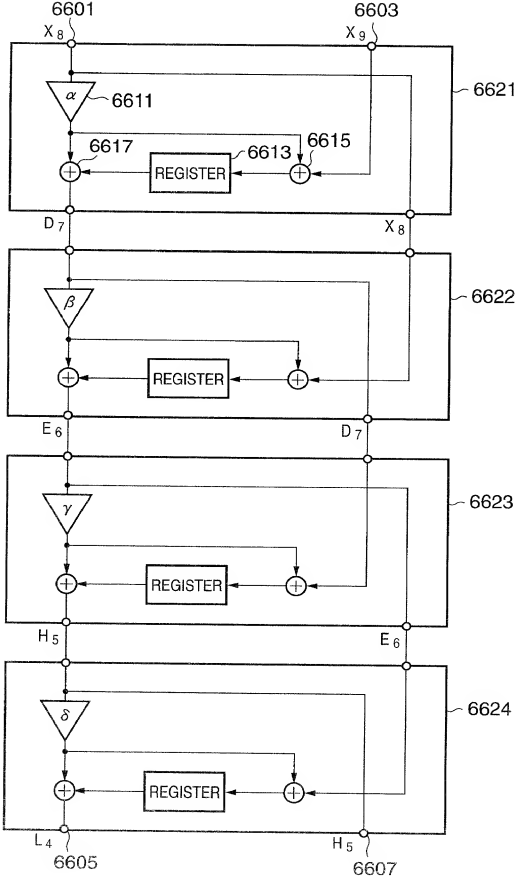


FIG. 74



WO 2021/225916 PCT/US2021/029660

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FIG. 75

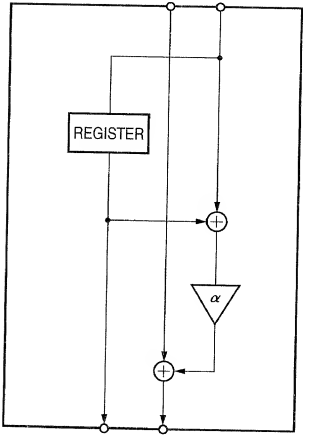

FIG. 76

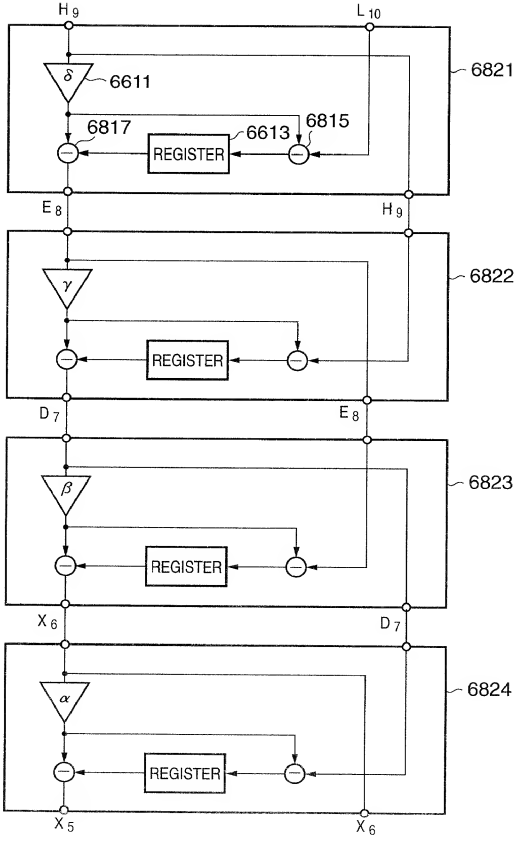

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FIG. 77

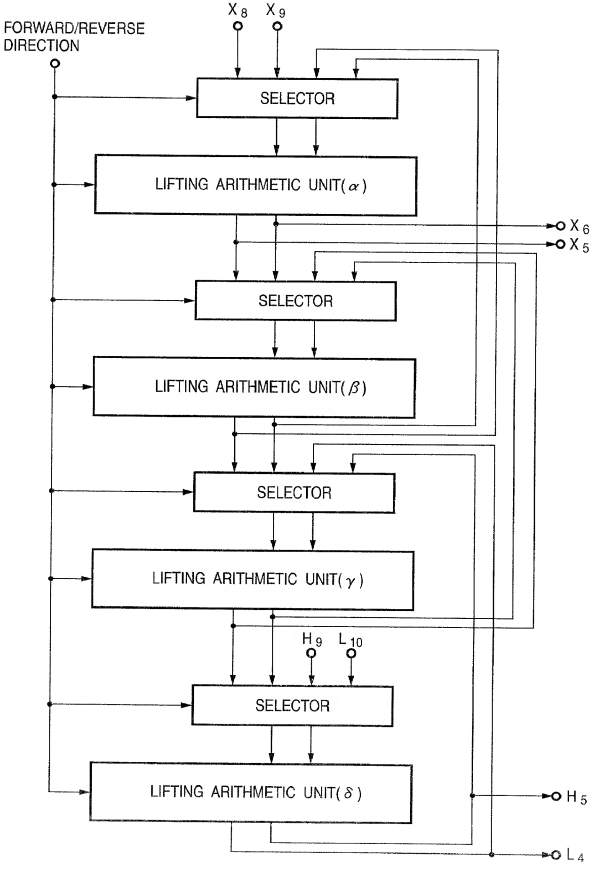

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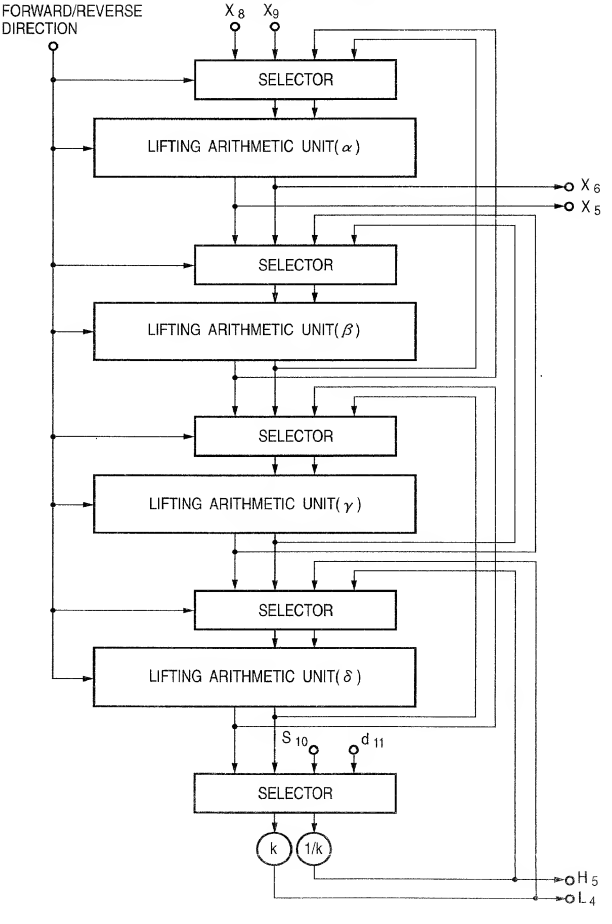
FIG. 78



JP2001-169288A 20010622

TO220T-9162866O

FIG. 79

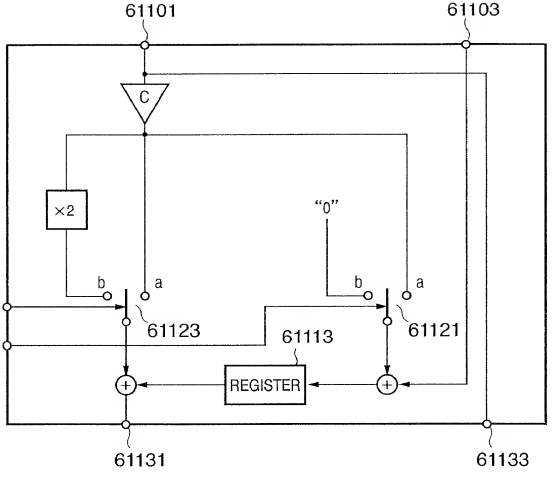


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FIG. 80

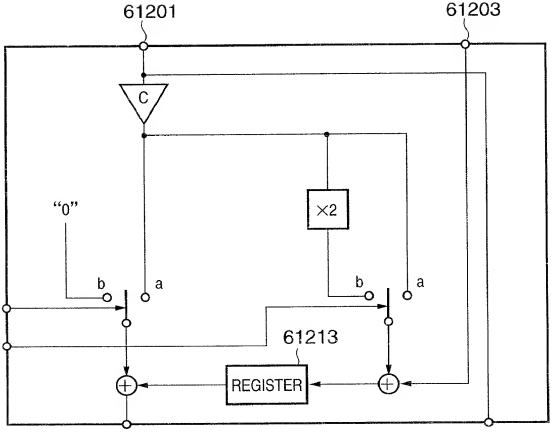

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FIG. 81

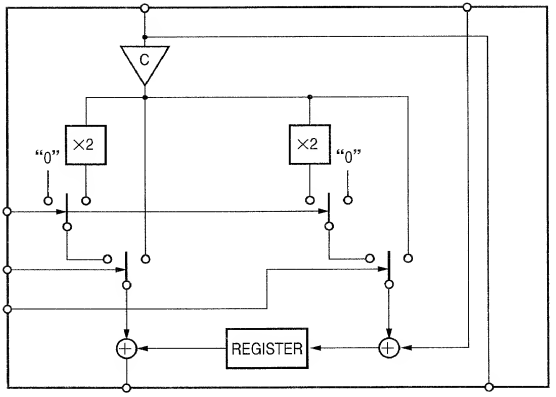


FIG. 82

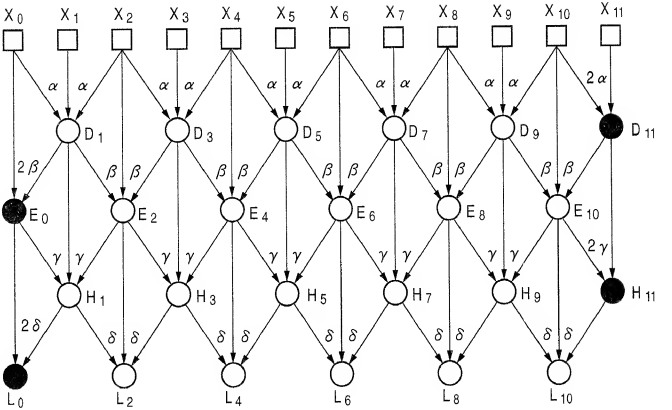
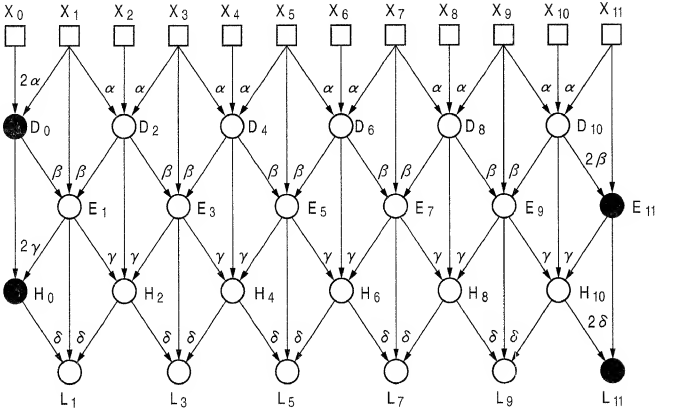

X0 X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11
α α α α α α α α α α 2α
D1 D3 D5 D7 D9 D11
2β β β β β β β β β β
E0 E2 E4 E6 E8 E10
γ γ γ γ γ γ γ γ γ γ 2γ
H1 H3 H5 H7 H9 H11
2δ δ δ δ δ δ δ δ δ δ
L0 L2 L4 L6 L8 L10

FIG. 83


X0 X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11
2α α α α α α α α α α α α
D0 D2 D4 D6 D8 D10
β β β β β β β β β β 2β
E1 E3 E5 E7 E9 E11
2γ γ γ γ γ γ γ γ γ γ γ γ
H0 H2 H4 H6 H8 H10
δ δ δ δ δ δ δ δ δ δ 2δ
L1 L3 L5 L7 L9 L11

JP2021-516828660

FIG. 84

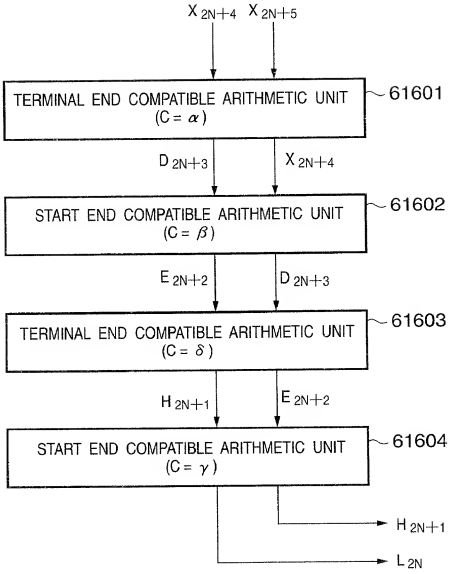


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FIG. 85

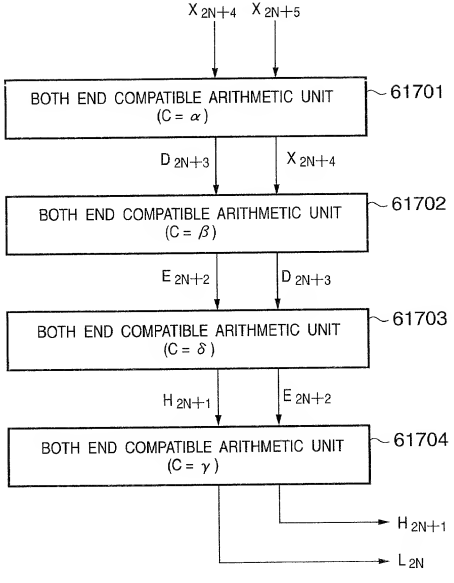

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FIG. 86

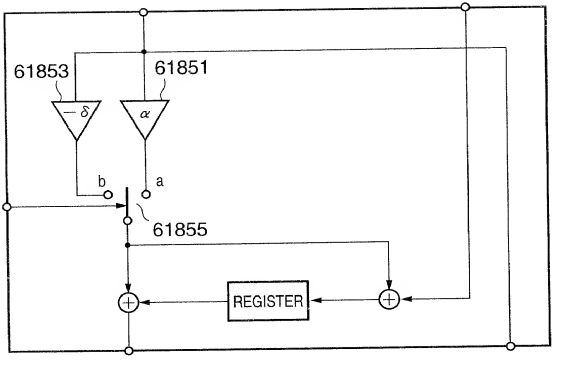

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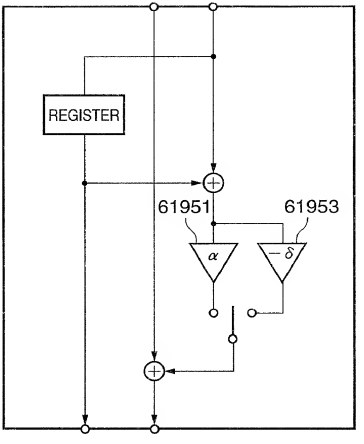
FIG. 87



JP2021-516829A 2021.07.08

FIG. 88

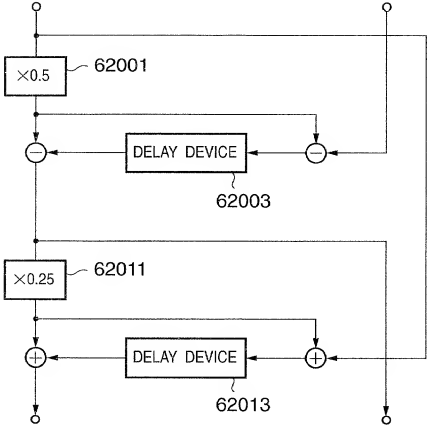


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FIG. 89

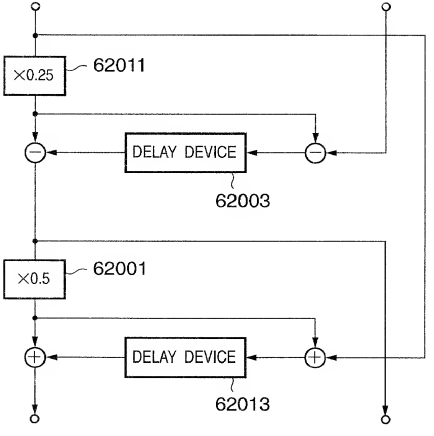

FIG. 90

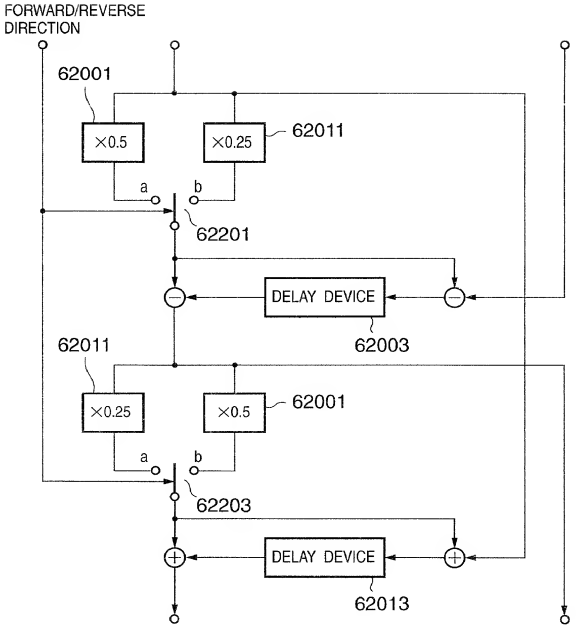

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FIG. 91

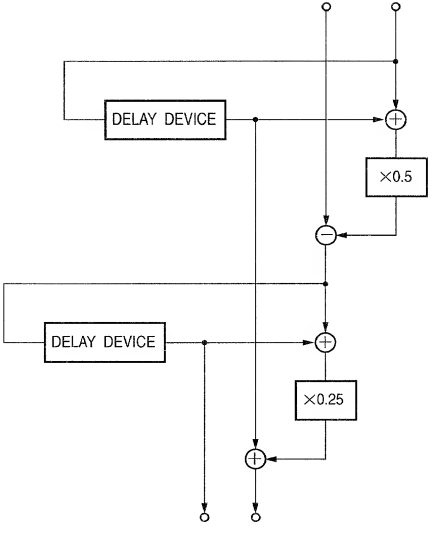

FIG. 92

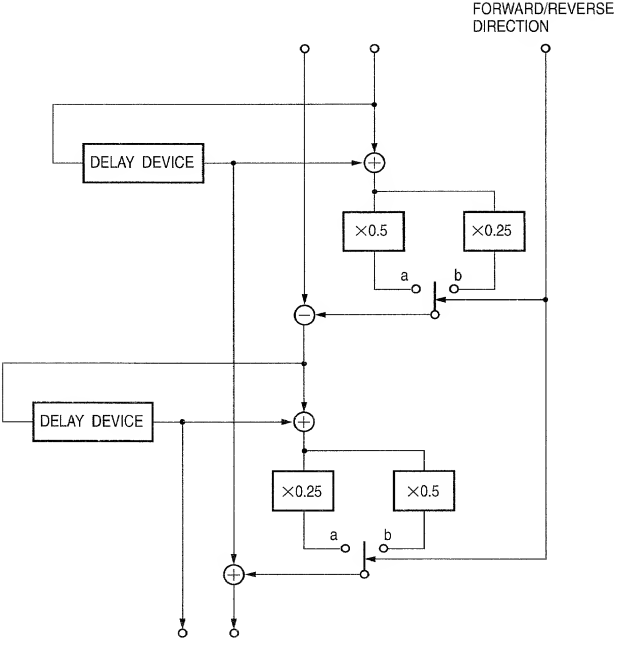

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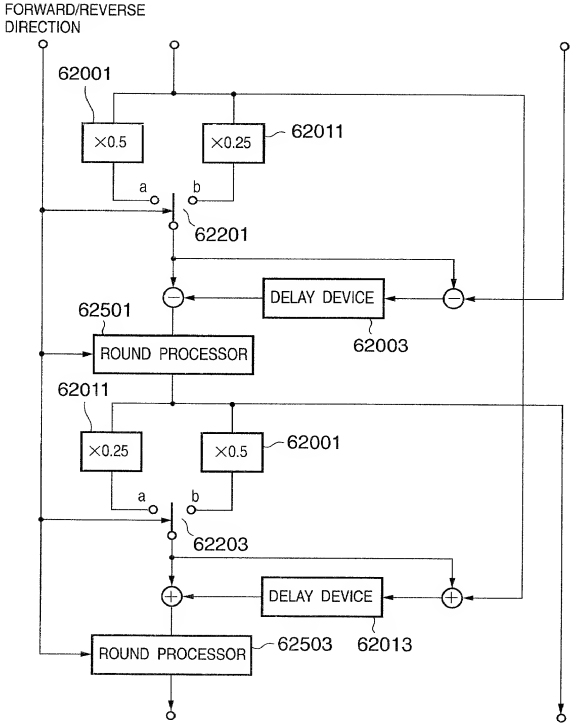
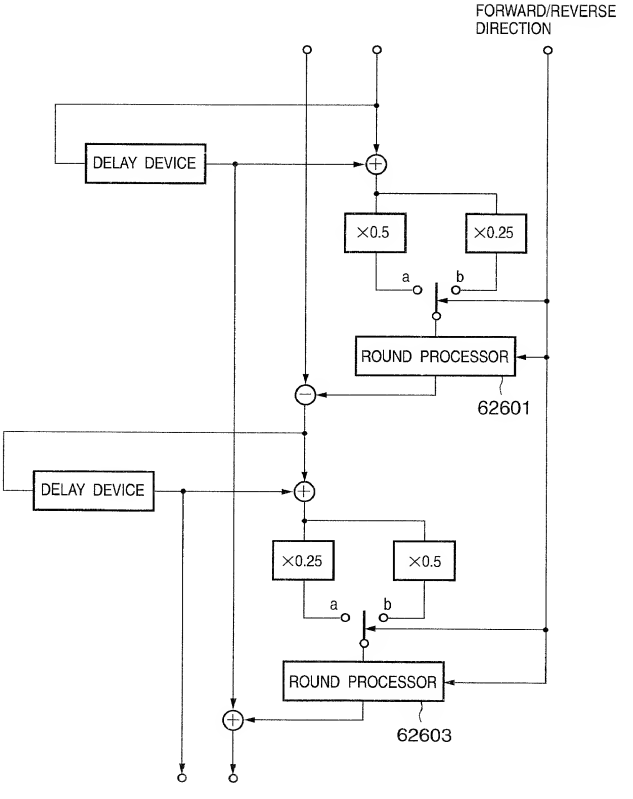
FIG. 93



US2001-0099691-A1 20010726

FIG. 94



JP2021162860A 2021.10.11

FIG. 95

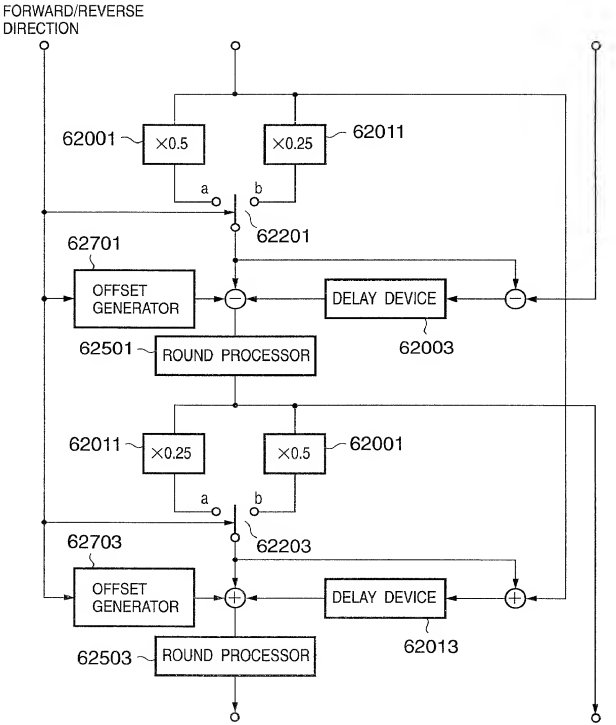
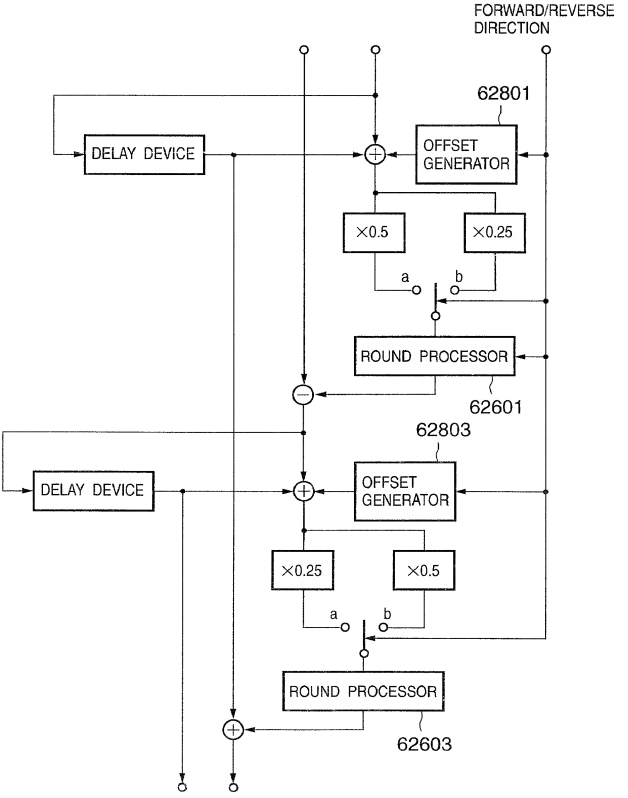
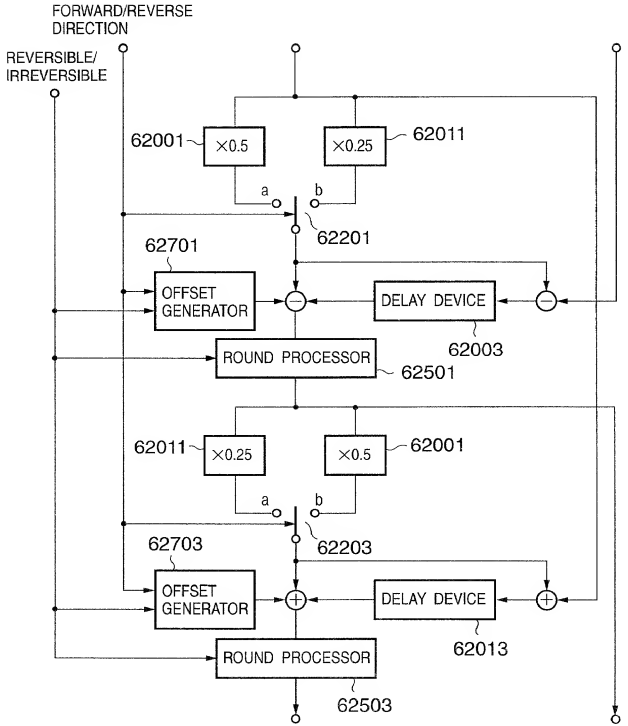

FORWARD/REVERSE DIRECTION
62001
×0.5
×0.25
62011
a
b
62201
62701
OFFSET GENERATOR
DELAY DEVICE
62501
ROUND PROCESSOR
62003
62011
×0.25
×0.5
62001
a
b
62203
62703
OFFSET GENERATOR
DELAY DEVICE
62503
ROUND PROCESSOR
62013

FIG. 96



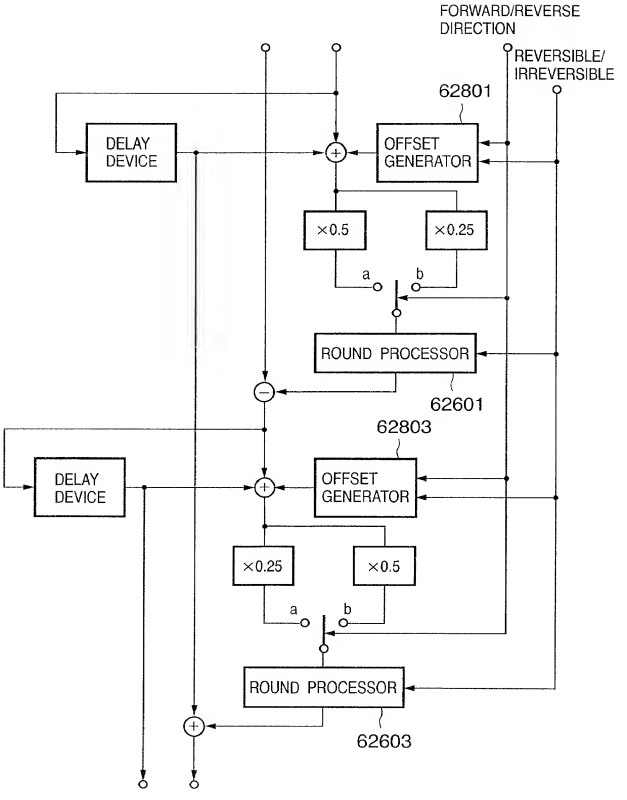
TO2207*9162866O

FIG. 97



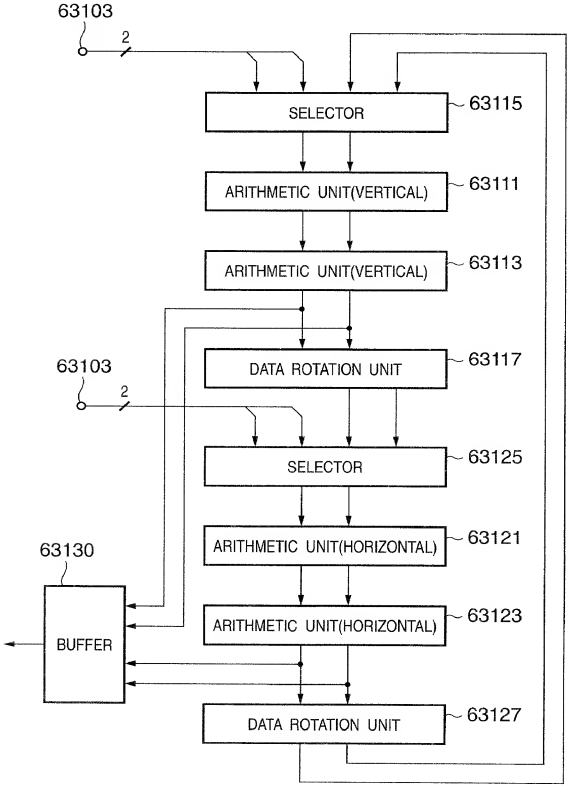
WO2021/162860 PCT/JP2021/001201

FIG. 98



JP2001-91628660

FIG. 99



JP2021-192201A 2021.12.16

JP2007-516660

FIG. 100

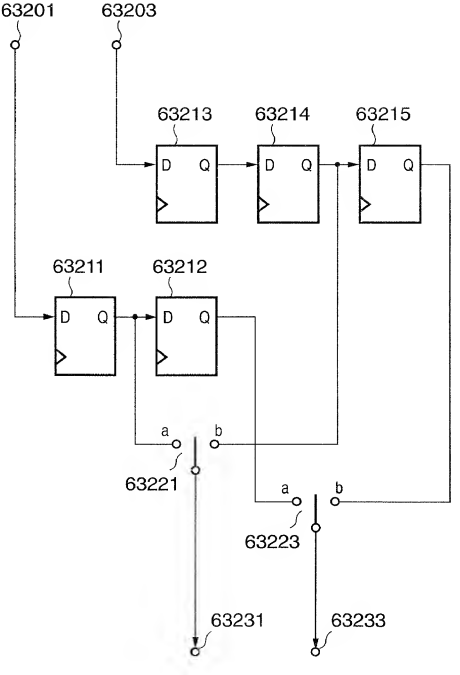
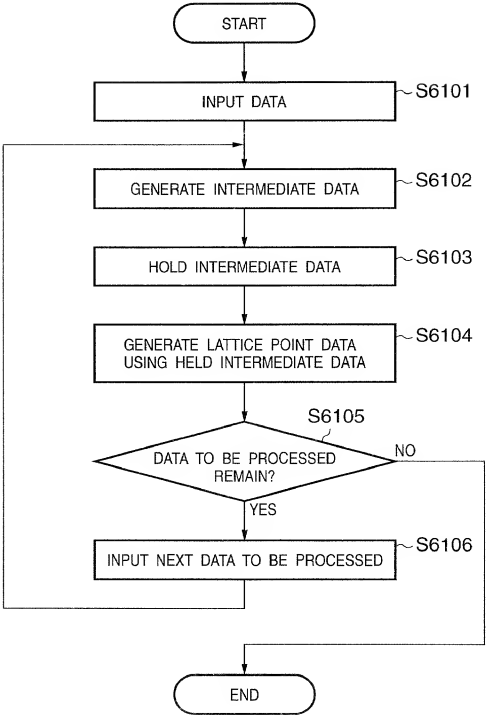


FIG. 101



JP2021-176090A